We claim:

1. A process for preparing polyoxymethylene by contacting a formaldehyde source with a catalyst of the formula I

$$\left[ML^1_aL^2_b \right]^{m+}_c \quad Z^{n-}_{c\cdot m/n} \qquad (I)$$

where

M is a metal of group VIII;

L^1 is cyclooctadiene;

each L^2 is independently tetrahydrofuran or a ligand which is displaceable by tetrahydrofuran;

Z is an anion;

a is 1 or 2;

b is an integer from 0 to 4;

c is 1 or 2; and

m and n are integers from 1 to 4.

2. A process as claimed in claim 1 where

M is Co, Rh, Ir, Ni, Pd or Pt.

3. A process as claimed in either of the preceding claims where L^2 is selected from tetrahydrofuran, nitriles, CO, alkenes, amines, ethers, carboxylic esters, cyclic carbonic esters, epoxides, hemiacetals, acetals and nitro compounds.

4. A process as claimed in claim 3 where L^2 is selected from acetonitrile, tetrahydrofuran and CO.

5. A process as claimed in any of the preceding claims where Z is a halide, sulfonate of the formula OSO_2R, where R is alkyl, partially or fully halogenated alkyl or aryl, carboxylate, complexed borate, complexed phosphate, complexed arsenate or complexed antimonate, with the proviso that not all Z radicals are halide.

6. A process as claimed in claim 5 wherein at least one Z radical is a perfluoroalkylsulfonate, tetrafluoroborate, hexafluorophosphate or hexafluoroantimonate.

7. A process as claimed in any of the preceding claims where the catalyst is selected from
$[Pd(II)(cod)(THF)_x](SbF_6)_2$ and
$[Pd(II)(cod)(CH_3CN)_x](PF_6)_2$
where
cod is cyclooctadiene,
THF is tetrahydrofuran and
x is an integer from 1 to 3.

8. A process as claimed in any of the preceding claims where the formaldehyde source is formaldehyde, trioxane or paraformaldehyde.

9. A process for preparing polyoxymethylene by contacting a formaldehyde source with a catalyst of the formula
$[Ir(III)Cp^*Cl_2Ir(III)Cp^*Cl]CF_3SO_3$
where
Cp* is pentamethylcyclopentadienyl.